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AMSAT NEWS SERVICE
ANS-328

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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SB SAT @ AMSAT $ANS-328.01
ANS-328 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 328.01

From AMSAT HQ SILVER SPRING, MD.
November 24, 2013
To All RADIO AMATEURS
BID: $ANS-328.01

A Historic Week for CubeSat Launches

This week has seen the deployment of 64 cubesats, with 35 of the satellites operating on amateur radio frequencies, now orbiting our Earth.

Barry Baines, WD4ASW, President of AMSAT-NA and all of the editors of the AMSAT News Service wish to congratulate all of the teams that have had satellites deployed. May your birds fly high, sing loud, and live long!

I have tried to capture a majority of the events as they have occurred from the newest (at the top) to the oldest (earlier in the week at the bottom). For further information please check the team's website or better yet, get on the air and work the birds!

[73, ANS Editor, Joe Spier, K6WAO]

FUNcube-1 spacecraft now named AO-73

The FUNcube team are delighted to be able to release the formal email received at the Bletchley Park monitoring station on the afternoon of Thursday, November 21, informing us that the FUNcube-1 spacecraft can now be referred to as AMSAT-OSCAR-73 (AO-73).

"Congratulations on the successful launch of the FUNcube-1 CubeSat, launched this morning from Yasny in Russia at 07:10:10.47 UTC November 21st 2013.

Since FUNcube-1 meets all of the requirements for being issued an OSCAR number, including coordination through IARU and requesting such a number; I, under authority vested in me by the President of AMSAT-NA, do hereby name FUNcube-1, ”AMSAT- OSCAR-73? or “AO-73.”

I, and all at AMSAT-NA wish AMSAT- OSCAR-73 great success in fulfilling all of its mission objectives and we welcome it to the long list of Amateur Radio satellites.

73,

William (Bill) Tynan, W3XO
OSCAR Number Administrator

FUNcube-1 Deployed
see http://amsat-uk.org/2013/11/21/funcube-1-deployed/

[ANS thanks AMSAT-UK for the above announcement]

Amateur Radio Satellites Launched Nov 21 on Dnepr

Signals heard from Funcube-1 and Triton-1 on first pass over EU.

A Russian Dnepr rocket launched on November 21 at 07:10:11 UTC from Dombarovsky near Yasny. This launch deployed 32 satellites, many of which are amateur radio or experimental using amateur radio frequencies.

Nader, ST2NH has developed graphics depicting the known satellites on the launch, as well as published frequencies of those using amateur radio. Nader's blog can be found at

http://st2nh-blogger.blogspot.co.uk/

A full list of known payloads can be found at

http://www.zarya.info/blog/?p=1745

Several of these satellites are expected to provide opportunities for two-way amateur communications via linear transponders, FM to DSB repeaters, or digital links.

FUNcube-1 from AMSAT-UK and AMSAT-NL is a 1U cubesat that includes an educational beacon and 20 kHz wide linear transponder. Detailed info is at:

http://funcube.org.uk/ and http://amsat-uk.org/funcube/funcube-cubesat/

Preliminary keps:

FUNCUBE-1
1 99991U 00000   13325.30956308 .00000106 00000-0 10000-3 0 00010
2 99991 097.7956 038.2570 0059925 198.5190 336.5388
14.77841394000015

Delfi-n3Xt is a 3U cubesat from Delft University of Technology that includes a 40kHz wide linear transponder and high speed S-band downlink. Detailed info may be found at

http://www.delfispace.nl/index.php/delfi-n3xt

Triton-1 is a 3U cubesat from ISIS-BV (Innovative Solutions In Space BV) with a AIS (ship location service) radio science experiment. After the experiment is complete (est. 3 months), the spacecraft radios will be reconfigured to U/V FM to DSB ("AO-16 mode") repeaters open for amateur use. More info is at
http://www.isispace.nl/cms/index.php/projects/triton-missions
and
http://www.amsatuk.me.uk/iaru/finished_detail.php?serialnum=224S

CubeBug-2

is a 2U cubesat from the Argentinian Ministry of Science, Technology and
Productive Innovation, INVAPS.E., Satellogic S.A., and Radio Club Bariloche
It is a technology demonstration mission, with digipeater and data downloads
open after initial experiments.
See http://2.cubebug.org/
and http://www.amsatuk.me.uk/iaru/finished_detail.php?serialnum=310

CubeBUG-2_SatelliteAdditional launch information will be added as it becomes
available.

[ANS thanks AMSAT-NA, for the above announcement]

NASA ELaNa-4 Cubesats Launched Nov 19 with ORS-3 Minotaur from Wallops, VA

LAUNCHED!

Eleven cubesats from NASA’s ELaNa Educational Launch of Nanosatellites
program
were launched on the ORS-3 mission on a US Air Force Minotaur-1 from
Wallops Flight Facility in Virginia. Launch scheduled for 2330 UTC
on November 19, 2013, with a target orbit of 500km circular, and 40.5 degree
inclination.

Cubesat.org recently published a list of those satellites in the amateur
service, or those using amateur frequencies under an experimental
license. The
list includes frequencies, modulation, beacon periods, and links to the
individual project web pages, and can be found at
http://cubesat.org/index.php/missions/upcoming-launches/135-ors3-launch-alert

Up to the minute launch data can be found at Spaceflight Now’s web site at
http://www.spaceflightnow.com/minotaur/ors3/status.html

Real time discussion regarding the launch can be found via IRC, with details
posted at http://www.cubesat.org/index.php/collaborate/ground-operators

UPDATE

Preliminary Keplerian elements have been released; refer to
http://cubesat.org/index.php/missions/upcoming-launches/135-ors3-launch-alert
for P-POD order assignments.

ORS3-2.2A
1 99900U 00000 13324.06792882 0.00000000 00000-0 00000-0 0 0005
2 99900 40.5215 249.9769 0002852 187.8940 351.5057 15.19723466000006
ORS3-2.3A
1 99901U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0007
2 99901 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000009
ORS3-2.3B
1 99902U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0008
2 99902 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000000
ORS3-2.3C
1 99903U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0009
2 99903 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000001
ORS3-2.5A
1 99904U 00000 13324.06862326 0.00000000 00000-0 00000-0 0 0000
2 99904 40.5214 249.9768 0003075 205.2431 337.9664 15.19728651000009
ORS3-2.5B

```
1 99905U 00000 13324.06862326 0.00000000 00000-0 00000-0 0 0001
2 99905 40.5214 249.9768 0003075 205.2431 337.9664 15.19728651000000
ORS3-2.5C
1 99906U 00000 13324.06862326 0.00000000 00000-0 00000-0 0 0002
2 99906 40.5214 249.9768 0003075 205.2431 337.9664 15.19728651000001
ORS3-2.6A
1 99907U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0003
2 99907 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000005
ORS3-2.6B
1 99908U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0004
2 99908 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000006
ORS3-2.6C
1 99909U 00000 13324.06827604 0.00000000 00000-0 00000-0 0 0005
2 99909 40.5215 249.9769 0002954 196.7779 344.5267 15.19722048000007
ORS3-2.7A
1 99910U 00000 13324.06792882 0.00000000 00000-0 00000-0 0 0006
2 99910 40.5215 249.9769 0002852 187.8940 351.5057 15.19723466000007
ORS3-2.7B
1 99911U 00000 13324.06792882 0.00000000 00000-0 00000-0 0 0007
2 99911 40.5215 249.9769 0002852 187.8940 351.5057 15.19723466000008
ORS3-2.7C
1 99912U 00000 13324.06792882 0.00000000 00000-0 00000-0 0 0008
2 99912 40.5215 249.9769 0002852 187.8940 351.5057 15.19723466000009
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[ANS thanks AMSAT-NA, for the above announcement]

South Africa ZACube-1 Now Named TshepisoSat

The South African Radio League posted this news in their SARL News Sunday November 24 Bulletins:

On Thursday 21 November 2013 the French South African Institute of Technology (F'SATI), at the Cape Peninsula University of Technology, made history by being the first in South Africa, and indeed the first in Africa, to launch a locally built nano satellite into orbit from a site in Russia.

Deon Coetzee, ZR1DE, who represented SA AMSAT at a ceremony held in the auditorium at the university campus reports that Vice Chancellor, Prof. Vuyisa Mazwi-Tonga, paid tribute to all at the university who made this achievement possible, and said she was immensely proud of being part of it all.

Original known as ZACube-1, the satellite has been named TshepisoSat, after a competition held for Grade 9 learners. Tshepiso is the seSotho word meaning promise.

The launch was the culmination of five years' work after the first proposal to build a small satellite as part of the engineering curriculum was put forward by Professor Robert van Zyl in February 2008. Co-operation of the French Government made possible the forming of F'SATI and the French Ambassador in South Africa, Elizabeth Barbier, during a video address, promised continued support by France for the programme.

ZACUBE-1 was one of fourteen cubesats aboard the thirty metre tall, three stage rocket. All the cubesats were successfully released at a height of 600 km above the Earth. TshepisoSat will circle the Earth up

to fifteen times per day in a polar orbit.

"At 11h13 the first signals from ZACUBE-1 were received amongst loud cheers", Deon said. According to Francois Visser, ZS1CED, who was the principal engineer and student mentor, the satellite was functioning well. The satellite also includes a small camera which will be used to monitor the releases of the 20 metre beacon antenna. The beacon will operate on 14 099 kHz and will be used to characterise the Superdarn antennas at the Antarctic which are used to study the ionosphere. A UHF beacon operates on 437,345 MHz. Follow progress at www.cput.ac.za/fsati and www.amsatsa.org.za

[ANS thanks the South African Radio League for the above information]

Assistance requested in receiving UNISAT-5 payloads

The Group of Astrodynamics for the Use of Space Systems (GAUSS) has asked for assistance in receiving some of the satellites deployed by the UNISAT-5 mini-satellite which was launched on a Dnepr from Yasny on November 21.

Dear All,

The Dnepr Cluster Launch 2013 has just been successfully accomplished: if anyone of the CubeSat community has the chance, please support GAUSS team in receiving some of the US5 payloads.
Try to get:
- PUCPSAT (from Perù): beacon @ 145.840 MHz (transmitting call sign OA0PUCP)
- HumSat-D (from Spain): 437.325 MHz
- WREN: 437.405 MHz

Thank you for your support!

GAUSSteam
–
Gruppo di Astrodinamica per l'Uso dei Sistemi Spaziali – Group of Astrodynamics for the Use of Space Systems
Via Lariana, 5
00199 Roma

Dnepr Yasny launch http://amsat-uk.org/satellites/dnepr-november-2013/

[ANS thanks AMSAT-UK for the above announcement]

Adding new satellites to SatPC32 and Gpredict

Erich, DK1TB, has provided a short guide on how to manually add new satellites to the SatPC32 satellite tracking app which is available from the AMSAT-UK shop.

The new FUNcube-1 AO-73 satellite is used as an example.

a. Copy the following address to the aux. file Celestrak.SQF (all aux. files
can be opened and edited from menu “?”, “Auxiliary Files”):
http://www.celestrak.com/NORAD/elements/tle-new.txt

b. Copy the following line to the file AmsatNames.txt
39417 13066B AO-73
That will convert the CelesTrak sat name 213-066B to AO-73. In menu
“Satellites” choose “SatNames”, “Use Amsat Names if Available”.

c. Copy the following lines to Doppler.SQF:
AO-73,145934.0,,USB,,,,TLM
AO-73,145960.0,435140.0,USB,LS
B,REV,,, Transponder

In menu “Satellites” choose “Sat Groups” and select – for example- the group
“Diverse” to have the sat in a separate list. With “Update Keps” download the
Celestrak file. It will appear in the left list of the menu. Click on the file
name. In the middle list you will see AO-73 with this name. Select it for the
right list and click “OK”. The group will later automatically use the chosen
CelesTrak file.

73s, Erich, DK1TB

Gpredict

Bryce KB1LQC describes how to update the free satellite tracking software
Gpredict:

You can add new TLE’s by using the Edit->Update TLE and choose network or
local files. I’ve found it interesting to get some of the FUNcube TLE’s in
there, maybe Gpredict is being picky but it’s worked. Also, there’s a downward
facing arrow in the top right window of Gpredict with a “configure” menu
option. I’ve placed my cursor over it in one of the screenshots. When you are
in there you can add and remove satellites as shown in the second screenshot.
Hope this helps!

Location of configure menu:
http://www.flickr.com/photos/101448394(a)N02/11015569633/ (Preview)
Inside Configure menu:
http://www.flickr.com/photos/101448394(a)N02/11015526594/ (Preview)

Satellite TLE Challenge Begins http://amsat-uk.org/2013/11/23/tle-challenge-begins/

ISS CubeSats http://amsat-uk.org/2013/11/16/iss-cubesats-deploy-tuesday-and-wednesday/

Minotaur-1 ELaNa-4 launch http://amsat-uk.org/satellites/elana-4-cubesats/

Dnepr Yasny launch http://amsat-uk.org/satellites/dnepr-november-2013/

[ANS thanks AMSAT-UK for the above announcement]

Triton-1 Update November 23

Triton-1 is a 3U cubesat from ISIS-BV (Innovative Solutions In Space BV) with
a AIS (ship location service) radio science experiment which was launched on November 21. After the experiment is complete (est. 3 months), the spacecraft
radios will be reconfigured to U/V FM to DSB (“AO-16 mode”) repeaters open for
amateur use.

This update was issued at 08:48 on November 23, 2013.

Hi all,

New TLE’s for the DNEPR launch have been issued, we believe that Triton-1 is object M.

2013-066M
1 39427U 13066M 13326.98436826 -.00002391 00000-0 -39688-3 0 10
2 39427 97.7901 39.5474 0120424 185.3601 174.6374 14.64539763 201

Meanwhile, Triton-1 is still in nominal mode, transmitting AX.25 BPSK on 145.822 MHz. Reception reports, especially in case the satellite is in safe mode (transmitting the safe mode CW beacon) are welcome!

73 on behalf of the team,

Wouter Jan Ubbels PE4WJ

Triton missions
http://www.isispace.nl/cms/index.php/projects/triton-missions

[ANS thanks AMSAT-UK for the above announcement]

Delfi-n3Xt Update November 22

Delfi Nanosatellite Program Manager, Jasper Bouwmeester, provides this update
on the Delfi-n3Xt satellite which was launched November 21 and carries a 435/145 MHz linear transponder.

Dear radio amateurs,

We had a fantastic launch and early reception of Delfi-n3Xt! The good news is
that Delfi-n3Xt is transmitting when in the Sun and is off in eclipse to save
battery power; just as we want it to be. The signal strength is also good.

VHF Reception

We have noticed however that the DUDe telemetry client does not properly

indicate the frequency offset and it is very difficult to get a lock on the signal.

Also our ICOM910 receivers have too limited bandwidth to receive a 2400 bit/s BPSK signal properly (although we had a few packets decoded with this, so it is just on the edge of what is possible). We now use only AR5000 in combination with an SDR to record a wide spectrum in IQ files. This way we can replay the files and retune the signal again and have been able to decode more packets than before. This morning at our second pass we were lucky to have a real time lock on the signal and retrieve many packets, so it is possible to have it right at once. But of course we would like to get the 'luck-factor' out of it.

A few people will look into the Costas PLL inside DUDe to see if we can improve its performance. Meanwhile, you can regard Delfi-n3Xt as a real challenging game to decode packets…

S-band reception

With respect to the S-band, we have not been able to test this as all our efforts go into VHF reception. The beacon is however on (also in eclipse), transmitting packets in a duty cycle of 5%, 1 Hz at 50 kbit/s MSK. The satellite is however still tumbling, so the antenna might be pointing in arbitrary direction. Next to this, a lot of gain is needed to be able to even see something above the noise floor (we have an 38dB dish). I believe that dish antenna below 25 dB will not be able to receive the beacon (let alone decode it). If someone however has the right equipment and good see the 1 Hz beacon, e.g. in a waterfall plot, please let us know and sent us a picture!

TLEs

These are the latest TLEs we have received:
1 00371U 00371A   13325.30974640 .00000000 00000-0 10000-4 0 7
2 00371 97.7888 38.2587 0131876 190.4863 345.6615 14.61864099 08

73,

Jasper

Telemetry reception
http://www.delfispace.nl/operations/delfi-n3xt-telemetry-reception

Delfi-n3Xt http://www.delfispace.nl/operations/radio-amateurs

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 (AO-73) Transponder Activation

The FUNcube Team have had reports of an apparent distortion in the transmitted

telemetry and difficulty in decoding around 12:00 UT today.

It is believed that this may have actually been occurring due to the natural phenomena of an active aurora rather than a problem on board the spacecraft. We understand that another spacecraft had the same issues around the same time.

The Team intend to command AO-73 back into autonomous mode during the 2035 UT pass this evening. This will mean that we should have the transponder active when in eclipse and telemetry only when in sunlight.

Everyday we learn something new!

best 73

FUNcube-1 team

Analysis of the telemetry data from FUNcube-1 (AO-73) is continuing. Thank you to all stations who have provided telemetry so far. More telemetry data is needed to enable the FUNcube team to characterise the satellite.

We would encourage stations to download the Dashboard software to receive the telemetry and upload it to the Data Warehouse.

FUNcube website http://www.funcube.org.uk/

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 Transponder in Autonomous Mode

A test of the Autonomous Mode on the FUNcube-1 (AO-73) SSB/CW linear transponder has been carried out.

It was switched into Autonomous Mode during orbit 32 at 1113 UT on Saturday, November 23. In this mode the transponder will automatically switch on when the spacecraft enters darkness, and switch off again when it enters sunlight.

During the test all radio amateurs in the footprint were encouraged to make their own tests of the transponder up/down links, and make contacts.

Among the contacts reported have been:

Alan ZL2BX: Transponder switched to eclipse mode OK about mid pass over ZL. Good signals from the transponder and had a brief contact with VK2MAL.

Malcolm VK2MAL: Good signals from AO-73 over VK tonight. Stations heard through the transponder were ZL2BX Alan and VK4CBW Wal.

If you did make a contact or test please report the details as a comment on the FUNcube website at http://funcube.org.uk/

Please note that the transponder frequencies have not yet been fully characterised.

FUNcube-1 Radio Communications Payload:
• 145.935 MHz BPSK Telemetry 300 mW or 30 mW when the transponder has been activated
• Inverting SSB/CW transponder 300 mW PEP
- 435.150 – 435.130 MHz Uplink
- 145.950 – 145.970 MHz Downlink

Analysis of the telemetry data from FUNcube-1 (AO-73) is continuing. Thank you
to all stations who have provided telemetry so far. More telemetry data is needed to enable the FUNcube team to characterise the satellite.

We would encourage stations to download the Dashboard software to receive the
telemetry and upload it to the Data Warehouse.

FUNcube website http://www.funcube.org.uk/

[ANS thanks AMSAT-UK for the above announcement]

Satellite TLE Challenge Begins

This week has seen deployments from the ISS, a Minotaur-1 and a Dnepr of an estimated 35 satellites carrying amateur radio payloads along with a number of
commercial and research satellites.

After a launch the North American Aerospace Defence Command (NORAD) issue the
Keplerian Two Line Element Set which can be used to determine the position and
velocity of the associated satellite. CelesTrak make this information available
and the file for launches in the past 30 days is available here.

After a new launch this file will list the ID’s of the objects that NORAD have
detected. These objects can be parts of the rocket body as well as the satellites. The challenge in the days after launch is to work out which object
ID’s correspond to which satellites.

On the AMSAT Bulletin Board (AMSAT-BB) Nico Janssen PA0DLO has posted an overview of the presently known IDs for the satellites that were launched between November 19-21.

ISS JSSOD Cubesat launches
2013-11-19 12:18 UTC
39412 1998-067DA Pico Dragon ?
39413 1998-067DB ArduSat 1 ?
39414 1998-067DC ArduSat X ?
To be confirmed when the objects have more separation.
2013-11-20 07:58 UTC
39415 1998-067DD TechEdSat 3P

Minotaur 1, Wallops Flight Facility
2013-11-20 01:15 UTC
ORS3 & ELaNa 4: 29 satellites

So far only 4 TLEs published. No IDs yet but probably:
39380 2013-064A STPSat 3

Dnepr, Yasny
2013-11-21 07:10:11 UTC
32 satellites
19 TLEs published
39417 2013-066B FUNcube 1
39427 2013-066M Triton 1
39428 2013-066N Delfi-n3Xt

Note that all designations may change later on.

73,
Nico PA0DLO

Keplerian Two Line Elements (TLEs or 'Keps'):
• New satellites launched in past 30 days
http://celestrak.com/NORAD/elements/tle-new.txt
• CubeSats http://celestrak.com/NORAD/elements/cubesat.txt
• Experimental satellites http://celestrak.com/NORAD/elements/x-comm.txt
• Engineering satellites http://celestrak.com/NORAD/elements/engineering.txt
• Amateur radio satellites
http://www.amsat.org/amsat/ftp/keps/current/nasa.all

NORAD Two-Line Element Set Format
http://celestrak.com/NORAD/documentation/tle-
fmt.asp

ISS CubeSats http://amsat-uk.org/2013/11/16/iss-cubesats-deploy-tuesday-and-
wednesday/

Minotaur-1 ELaNa-4 launch http://amsat-uk.org/satellites/elana-4-cubesats/

Dnepr Yasny launch http://amsat-uk.org/satellites/dnepr-november-2013/

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 (AO-73) Transponder Test Saturday November 23

The FUNcube Team are planning to open the SSB/CW linear transponder on the
FUNcube-1 (AO-73) CubeSat for a single orbit on Saturday, November 23.
The aim
of this test is to establish the thermal performance of the satellite
when in
this mode for an extended period.

All radio amateurs who are in the footprint are welcome to make their own
tests of the transponder up/down links, and make contacts. It is planned to
switch on the transponder either during the orbit timed at 0937 UT
(orbit 31)
at the Time of Closest Approach (TCA) to Bletchley Park, or the
following orbit
at 1113 UT (orbit 32).

If you do make a contact or test please report the details as a comment
on the
FUNcube website at

http://funcube.org.uk/2013/11/22/transponder-test-tomorrow-
23-nov-2013/

Please note that the transponder frequencies have not yet been fully
characterised.

FUNcube-1 Radio Communications Payload:
• 145.935 MHz BPSK Telemetry 300 mW or 30 mW when the transponder has been
activated
• Inverting SSB/CW transponder 300 mW PEP
- 435.150 – 435.130 MHz Uplink
- 145.950 – 145.970 MHz Downlink

FUNcube website http://www.funcube.org.uk/

First Transponder Test http://amsat-uk.org/2013/11/22/funcube-1-ao-73-
transponder-tested/

[ANS thanks AMSAT-UK for the above announcement]

$50Sat Eagle2 PocketQube Operational

$50SAT – Eagle2 – the PICAXE and RFM22B micro satellite was successfully
launched from Dombarovsky Air Base in Russia on November 21 at 07:10 UT.

It went active soon after being released from UNISAT-5 and the 437.505
MHz (+/-
10 kHz Doppler shift) Morse beacon from $50SAT was heard in the UK at 10:28
that morning (Nov. 21).

$50SAT is a very low cost and simple satellite and most radio amateurs
should
be able to receive the Morse beacon and FSK RTTY data with an omni
directional
antenna.

The primary purpose of $50SAT (Eagle2) was to create a cost effective
platform
for engineering and science students to use for developing real world
skills.
The PocketQube form factor has no precision mechanical parts and can be
built
from locally obtained sheet metal.

$50sat is comprised of two 40mm x 40mm circuit boards. The first is the
processor/radio board which contains the PICaxe 40X2 processor programmed in
PICaxe basic, the Hope RFM22B single chip radio and some peripheral devices.
The PICaxe 40X2 is an easy to use micro controller popular in the education
sector.

The second board is the power control and monitor board. This board contains
four maximum power point controllers, one for each solar array on each
side of
the spacecraft as well as current monitors for the battery and summed solar
power. The battery is a common 3.7 volt lithium ion camera battery.

The satellite will transmit data telemetry about the satellites operation, a
sequence of call signs in slow FM Morse and some key data as fast FM

Morse (120
WPM). The main data payload will also be transmitted as FSK RTTY which
should
be readily heard on the ground with basic amateur radio equipment.

$50SAT has been a collaborative education project between Professor Bob
Twiggs, KE6QMD, Morehead State University and three other radio
amateurs, Howie
DeFelice, AB2S, Michael Kirkhart, KD8QBA, and Stuart Robinson, GW7HPW.

The $50SAT team plan to make all the software and hardware designs freely
available to anyone who wants them for personal or educational use. The
PICAXE
software and EagleCad files for the processor and radio board should soon be
added to the $50SAT DropBox.

Information on the communications payload is now available in the $50SAT
Dropbox at https://www.dropbox.com/sh/l3919wtfiywk2gf/-HxyXNsIr8

There is a discussion group for $50SAT at:
http://groups.yahoo.com/neo/groups/50dollarsat/conversations/topics

The $50SAT team plan to make all the software and hardware designs freely
available to anyone who wants them for personal or educational use.

50DollarSat http://www.50dollarsat.info/

HOPE RFM22B FSK transceiver http://www.hoperf.com/rf/module/fsk/RFM22B.htm

PICAXE-40X2 microcontroller
http://www.picaxe.com/Hardware/PICAXE-Chips/PICAXE-
40X2-microcontroller/

[ANS thanks AMSAT-UK for the above announcement]

BBC TV visit FUNcube station at RSGB National Radio Centre

On Friday, November 22 a film crew from the BBC Breakfast show visited the
RSGB National Radio Centre (NRC) at Bletchley Park to interview the FUNcube
Project team about the new educational amateur radio satellite FUNcube-1
(AO-
73).

BBC presenter John Maguire interviewed Graham Shirville G3VZV at the GB3RS
station in the NRC. Other members of the FUNcube team were filmed making
a SSB
contact from the Bletchley Park car park using the linear transponder on
FUNcube-1.

The interview should be broadcast on the BBC One TV Breakfast show on
Monday,
November 25, between 6 and 9 AM. Shortly after a recording of the show
should
be made available for 7 days to view on the web at
http://www.bbc.co.uk/programmes/b03jcfh2

The FUNcube segment will be short, only 2 or 3 minutes, but should be shown

several times during the 3 hour show possibly at 10 minutes before each hour.

During the visit to the National Radio Centre, John Maguire asked the FUNcube
Team to support a visit to a local school, Abbeys Primary School in Bletchley,
to meet up with some 10-11 year old pupils and talk to them about the FUNcube
project.

The visit was a huge success, with the school children asking lots of questions. As this was the first educational outreach opportunity after launch,
the school children were asked to compose a Fitter message which the FUNcube Team will upload to FUNcube-1 (AO-73) when they have decided what it should be!
(Teachers's comment "Might be their home work!").

BBC One TV live on the web http://www.bbc.co.uk/tv/bbcone/live

BBC Breakfast show http://www.bbc.co.uk/programmes/b006v5tb

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 (AO-73): First Transponder Test

The first test of the FUNcube-1 (AO-73) SSB/CW linear transponder took place on Friday, November 22. The transponder was successfully commanded on at 10:49
UT and at 10:51 GB3RS successfully transmitted through the inverting transponder using a pair of Yaesu FT-817 transceivers and an Arrow dual-band antenna.

A two-way contact was then made between GB3RS and G0AUK who worked each other
at 10:53 UT. Both stations were operating from the Bletchley Park car park each
running 5 watts PEP to Arrow antennas.

Ciaran Morgan M0XTD captured the entire downlink passband during the pass on a
Microsoft Surface Tablet using a FUNcube Dongle Pro+ SDR connected to an Elk dual-band antenna.

Howard Long G6LVB also worked AO-73 while Ciaran Morgan M0XTD captured the downlink passband data using a FUNcube Dongle Pro+ and Microsoft Surface Tablet

FUNcube-1 carries a 20 kHz bandwidth transponder for SSB and CW communications. To reduce the Doppler shift the transponder is inverting meaning that a Lower Sideband (LSB) signal on the uplink comes out as an Upper
Sideband (USB) signal on the downlink.

Testing and analysis of the telemetry data from FUNcube-1 (AO-73) is continuing.

Thank you to all stations who have provided telemetry so far. More telemetry data is needed to enable the FUNcube team to characterise the satellite.

We would encourage stations to download the Dashboard software to receive the
telemetry and upload it to the Data Warehouse

The FUNcube Team hope to do further transponder tests possibly Saturday, November 23.

FUNcube-1 Deployed !!! http://amsat-uk.org/2013/11/21/funcube-1-deployed/

BBC TV visit FUNcube station at RSGB National Radio Centre
http://amsat-uk.org/2013/11/22/bbc-visit-funcube-station-at-rsgb-national-radio-centre/

FUNcube website http://www.funcube.org.uk/

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 (AO-73): First Fitter Message Uploaded

First Fitter Message Uploaded (FM8)

On Thursday evening the FUNcube team successfully uploaded the first Fitter message to the FUNcube-1 (AO-73) satellite.

‘Fitter’ is derived from ‘Twitter’. So it’s like a tweet, but via FUNcube.

The message is a short (200 characters maximum) text-like message which can be
uploaded to the satellite (by authorised ground stations), and which can be transmitted several times every five minutes or so. It will continue to be retransmitted until such time as it is replaced by a new Fitter Message.

The message uploaded was:
"Thanks to ZS1LS for receiving and uploading
the first FUNcube-1 (AO-73) packets"

There is memory space for a total of nine such Messages (total 1800 characters).

[ANS thanks AMSAT-UK for the above announcement]

FUNcube-1 Loud and Clear in Essex

Pete Sipple M0PSX from the Essex Ham website was one of a handful of UK amateurs to receive and decode the data signals from the satellite in its second UK pass at 10:28 GMT today.

Pete had tried receiving the first pass over the UK just before 09:00 GMT, but

this was very low on the horizon and he wasn't able to receive it here in Essex. At the time FUNcube-1 was on low power running just 30 mW by the time of
the second UK pass it was running high power, 300 mW.

You can see screenshots of the data, an audio recording of the pass, and details on how to receive signals from FUNcube-1 on the Essex Ham site:
http://www.essexham.co.uk/news/funcube-1-live-and-heard-over-essex.html

The audio of FUNcube-1 received in Essex on an omni-directional colinear
http://www.essexham.co.uk/media/funcube_1028_21nov13.mp3

[ANS thanks AMSAT-UK, for the above announcement]

FUNcube-1 on BBC News

The BBC report that the Dnepr rocket launching from Yasny in Russia has set a
record for the most payloads carried to orbit in a single mission.

They say the converted intercontinental missile released 32 objects in space –
mostly small, so called "cubesats".

Read the BBC story Rocket deploys spacecraft armada at
http://www.bbc.co.uk/news/science-environment-25035490

Story on NASA Space Flight
http://www.nasaspaceflight.com/2013/11/russian-dnepr-record-breaking-32-satellite-haul/

Latest FUNcube-1 TLE's:

FUNCUBE
1 00312U 00312A   13325.30964218 .00000000 00000-0 10000-4 0 7
2 00312 97.7992 38.2578 0062122 196.7894 338.6768 14.77349691 03

[ANS thanks AMSAT-UK for the above information]

Florida SwampSat Team Request Assistance

The SwampSat team at the University of Florida is requesting assistance in collecting telemetry from their 1U pico-satellite, which was successfully launched at 01:15 UT on November 20. SwampSat will begin transmitting a beacon
after 01:15 UT on November 21 (24 hours after launch). The details are:

Tx frequency = 437.385 MHz
AFSK modulation
9600 baud, 60 second interval
AX.25
1 W transmission power

The call sign is currently WG4SAT. Any operators who are able to copy

telemetry are encouraged to send it to telemetry(a)swampsat.org. Telemetry strings can be pasted into the email body, or attached as a text file. Please include your call sign in telemetry submissions. We will be distributing some more automated tools in the near future.

Your assistance is greatly appreciated.

Sincerely,
The SwampSat team
University of Florida

University of Florida Small Satellite Design Club (SSDC)
http://www.ufsmallsat.com/

Gator Amateur Radio Club http://www.gatorradio.org/

Unveiling of Florida Student CubeSat SwampSat
http://amsat-uk.org/2012/06/30/unveiling-of-florida-student-cubesat-swampsat/

SwampSat on TV News http://amsat-uk.org/2012/06/19/swampsat-on-tv-news/

[ANS thanks the SwampSat Team and AMSAT-UK for the above information]

FUNcube-1 Deployed

The Dnepr carrying FUNcube-1 and 18 other satellites carrying amateur radio payloads successfully launched at 07:10:11 UT on Thursday, November 21. Approximately 8 minutes later, FUNcube-1 was deployed from the upper stage of the Dnepr rocket.

About 10 minutes after separation, telemetry was successfully been received, decoded using the Dashboard App, and uploaded to the data warehouse by ZS1LS (at 07:37) and ZS6BMN in South Africa. There was a huge cheer at Bletchley Park and the FUNcube-1 Project team toasted the successful launch .

All main parameters on FUNcube look nominal; temp, battery voltage, solar panel charging rate, etc and the data received so far is available in the Data Warehouse. The team are already seeing some superb examples of the data that will be fundamental to the educational aspect of FUNcube – thank you to all stations around the world for your efforts so far.

The first signals from FUNcube-1 were heard in the UK on the first visible pass at 3 degrees above the horizon and Mike Willis, G0MJW, became the first UK station to receive and decode the telemetry from FUNcube-1 – congratulations Mike.

For the first two orbits FUNcube-1 was in Safe mode with the beacon transmitting low power just 30 mW. FUNcube-1 was then commanded into Educational mode which increased the power to 300 mW. This enabled it to be copied on a SSB handheld with whip antenna.

The FUNcube team encourage all stations to continue to receive the telemetry and upload it to the Data Warehouse as we monitor the spacecraft and

continue
with the early operations tasks.

These satellites were heard during the morning passes:
• FUNcube-1
• ZACUBE-1
• Delfi-n3xt
• Triton-1
• CubeBug-2
• UWE3 9k6
• HumSat-D

One of the satellites on the launch UniSat-5 will deploy a number of
additional satellites. Among them should be the CubeSats PUCP-SAT-1,
HumSat-D,
estar-2, Icube-1 and the PocketQubes Wren, Eagle-1 (BeakerSat), Eagle-2
($50Sat), QB-Scout1. PUCP-SAT-1 intends to subsequently release a further
satellite Pocket-PUCP.

As well as UniSat-5 and its associated CubeSats and
PocketQubes these amateur radio satellites were also on the launch:
HinCube
FUNcube-1
ZAcube-1
First-MOVE
UWE-3
Velox-PII
CubeBug-2
Triton-1
Delfi-n3Xt
GOMX-1

Frequency list for amateur radio satellite deployments in November
http://amsat-uk.org/2013/11/13/three-amateur-radio-satellite-deployments-in-
november/

Mass Amateur Radio Satellite Launch November 21
http://amsat-uk.org/2013/11/08/mass-amateur-radio-satellite-launch-november-21/

Download the FUNcube-1 Dashboard App
http://funcube.org.uk/working-documents/funcube-telemetry-dashboard/

FUNcube-1 Data Warehouse
http://funcube.org.uk/ground-segment/the-data-warehouse/

Online Real-Time satellite tracking of FUNcube-1 based on preliminary keps
http://www.n2yo.com/?s=99991

A live video stream from the Bletchley Park station is at
http://batc.tv/streams/funcube1

[ANS thanks the AO-73 Team and AMSAT-UK, for the above information]

FUNcube-1 Bletchley Park monitoring station ready for launch

FUNcube team members spent Wednesday, November 21 setting up and testing the
satellite monitoring station at the RSGB National Radio Centre (NRC) in
Bletchley Park.

All members of the FUNcube development team (except Gerard Albers, who has had
to stay Holland) assembled at National Radio Centre at Bletchley Park ready for the launch early tomorrow morning.

They added satellite equipment to the existing excellent demonstration station. As part of our testing, we made a couple of QSOs via VO-
52, one with UR3CTB and another with OH5LK. Earlier in the day, we also confirmed that we could receive signals from a low elevation pass of the same
satellite. So we are poised for an early start tomorrow morning.

A live video stream from the Bletchley Park station is at http://batc.tv/streams/funcube1

Preliminary Keplerian Two-Line Elements (TLEs):
FUNCUBE-1
1 99991U 00000   13325.30956308 .00000106 00000-0 10000-3 0 00010
2 99991 097.7956 038.2570 0059925 198.5190 336.5388 14.77841394000015

Satellite tracking http://amsat-uk.org/beginners/satellite-tracking/

FUNcube communication subsystem:
• 145.935 MHz BPSK Telemetry 30 or 300 mW
• Inverting SSB/CW transponder 300 mW PEP
- 435.150 – 435.130 MHz Uplink
- 145.950 – 145.970 MHz Downlink

FUNcube website http://www.funcube.org.uk/

Forum for Question and Answers on FUNcube Satellite and Dashboard App http://amsat-uk.org/funcube/yahoo-group/

FUNcube Yahoo Group http://amsat-uk.org/funcube/yahoo-group/

[ANS thanks AMSAT-UK, for the above information]

Minotaur-1 Deploys CubeSats

A large number of CubeSats carrying amateur radio payloads were launched from
NASA’s Wallops Flight Facility in Wallops Island, Va., on Nov. 19, 2013 at 0115
UT. In total 29 satellites were on the rocket of which 12 operate in Amateur Satellite Service frequencies.

Radio amateurs from around the world have reported receiving signals from the
satellites.

For the latest news check the DK3WN satellite blog http://www.dk3wn.info/p/

Also see the AMSAT Bulletin Board (AMSAT-BB) http://www.amsat.org/amsat-new/tools/maillist/

Minotaur-1 Launch: Keplerian Two-Line Elements (TLEs)
http://amsat-uk.org/2013/11/19/minotaur-1-launch-keplerian-two-line-elements-
tles/

Doppler.sqf data at http://www.dk3wn.info/p/?p=38470

Satellite tracking http://amsat-uk.org/beginners/satellite-tracking/

Frequency list for amateur radio satellite deployments in November
http://amsat-uk.org/2013/11/13/three-amateur-radio-satellite-deployments-in-november/

[ANS thanks AMSAT-UK, for the above information]

Triton-1 Update

As part of the November 21 of the Dnepr launch vehicle, the Triton-1 satellite,
a 3-unit cubesat developed by ISIS – Innovative Solutions In Space from Delft, The Netherlands. Note that the Triton-2 satellite is not on this launch, its launch date is yet to be determined at this stage. Triton-2 will be similar to Triton-1, the main difference being that it will also carry an S-band downlink and associated mode US transponder.

Triton-1 is a satellite which will serve as a test bed for an experimental receiver, designed to receive Automatic Identification System (AIS) messages from ships. During the first three months after launch,
the plan is to characterize the AIS receiver in orbit. After approximately three months of experimenting, we intend to activate a single channel FM to DSB
mode UV transponder (similar to AO-16?s transponder). The exact transponder uplink frequency in the 435-438 MHz band will be announced at that time as well.

We have created an amateur radio information page which contains all information related to its downlink signals at:

http://www.isispace.nl/HAM/

We intend to publish regular status updates on the AMSAT-BB as well as on the
aforementioned page.

[ANS thanks the Triton-1 team and AMSAT-UK, for the above information]

FUNcube Dashboard – New Version v806 Released

A couple of issues have come to light and have been corrected in this latest version.

Fixes in release v806
- enhancements to the audio capture and processing.
- Audio Devices now handled correctly when a Dongle is attached with Dashboard

running.
- User Warehouse settings will now be retained for future upgrades to the Dashboard.
- Updates error messages.
- Should no longer crash when going to settings and help pages

To download this latest version of the FUNcube Dashboard and the supporting documentation go to

http://funcube.org.uk/working-documents/funcube-telemetry-dashboard/

which is being kept right up-to-date.

FUNcube Yahoo Group http://amsat-uk.org/funcube/yahoo-group/

[ANS thanks AMSAT-UK for the above information]

Help Track ISS CubeSats

Astronaut Koichi Wakata, KC5ZTA, deployed the CubeSats ArduSat-1, ArduSat-X along with Pico Dragon from the International Space Station at 1218 UT on Tuesday, November 19.

Pico Dragon was developed by the Viet Nam National Satellite Center (VNSC), University of Tokyo and IHI aerospace. It has a 437.250 MHz CW beacon and 437.365 MHz 1200 bps AFSK AX.25 telemetry.

Mineo Wakita, JE9PEL, has received the CW signal from Viet Nam’s Pico Dragon CubeSat but nothing was heard from ArduSat-1 or ArduSat-X.

Listen to the recording of the PicoDragon CW beacon made at 16:08-16:17 UTC, 19 Nov 2013, Ele 28 S-E-EN, 437.250MHz CW
http://www.ne.jp/asahi/hamradio/je9pel/31119pic.mp3

The Pico Dragon beacon has been reported as appearing about 3 kHz high of the
expected frequency.

Edward BX1AD reports hearing ArduSat-1: I heard ArduSat-1 CW (FM-modulated 800Hz tone) on 437.000 MHz during the pass 01:51 – 02:00 UT Nov. 20, decoded as
following:
WG9XFC-1 D16
WG9XFC-1 E16
WG9XFC-1 A7.27

The ArduSat team have released the following information:

If you’re a radio amateur and would like to help out the ArduSat team, you can
listen for our Morse beacons and send them to us! This beacon gives us important information – like battery voltage and lets us know that the satellites are still alive!

The initial TLE for AS-1 and AS-X will be the same as the ISS until they put some distance between each other and are assigned their own Noad IDs.
TLE for ISS: http://www.celestrak.com/NORAD/elements/stations.txt

Both satellites will have a Morse beacon (FM-modulated 800Hz tones) that is transmitted at 20 WPM every two or three minutes on 437.000 MHz. The beacon will be structured in the following format:

ArduSat-1 beacon: Battery voltage (uint16_t), RX_counter (number of received valid data packets, uint32_t), TX_counter (number of sent valid data packets,
uint32_t), “WG9XFC-1?

ArduSat-X beacon: Battery voltage (uint16_t), RX_counter (number of received valid data packets, uint32_t), TX_counter (number of sent valid data packets,
uint32_t), “WG9XFC-X”

Submitting a beacon packet:
You can submit a beacon as plain text to nanosatisfi(a)gmail.com – be sure to put the word “packet” in the subject line so that we can parse it quickly.

Submitting audio:
You can submit audio as an email attachment. Send an email to nanosatisfi(a)gmail.com – with the audio file as an attachment.

ArduSat https://ardusat.org/

Source: http://www.nanosatisfi.com/2013/11/help-track-ardusat-1x/

ISS CubeSats Deploy Tuesday and Wednesday
http://amsat-uk.org/2013/11/16/iss-cubesats-deploy-tuesday-and-wednesday/

Frequencies of amateur radio satellites launching in November
http://amsat-uk.org/2013/11/13/three-amateur-radio-satellite-deployments-in-november/

[ANS thanks AMSAT-UK for the above announcement]

Delfi-n3Xt Update

The Delfi-n3Xt has a 435/145 MHz linear transponder and is on the November 21
Dnepr launch. Jasper sends this update:

Dear radio amateurs,

We have made some changes to the webserver and the telemetry client to resolve
some issues with the connection as stated before. It seems that the system is
now improved, but we are not a 100% certain if it will be stable for long term.
Unfortunately our resources and time are limited, so we have decided to go ahead with the systems as-is.

Attached is the new DUDe client, version 5.0. Please delete the previous version (4.7) in case you still have this on your computer. Thank you for your
help and patience so far!

After orbit injection of Delfi-n3Xt, the satellite will first be idle for 25 minutes and then start deployment of about 5 minutes. The satellite will not

transmit on the 145.870 MHz during eclipse, so the first time Delfi-n3Xt can theoretically be heard is about 8:38h UTC.

Attached are also the pre-launch TLE set which can be used in tracking programs. We will announce new TLEs on our website after launch as soon as they
become available. After a few days, the satellite should appear in one of the
regular automatically updated lists.

I am looking forward for a wonderful launch next Thursday, with many radio amateur satellites on board, and of course successful reception of Delfi-n3Xt!

73,

Jasper

J. (Jasper) Bouwmeester, MSc.
Delfi Nanosatellite Program Manager &
Researcher Small Satellite Technology
Chair of Space Systems Engineering
Delft University of Technology

Telemetry reception
http://www.delfispace.nl/operations/delfi-n3xt-telemetry-reception

Delfi-n3Xt http://www.delfispace.nl/operations/radio-amateurs

[ANS thanks AMSAT-UK for the above announcement]

Help needed with the CAPE II satellite

Nick K5QXJ writes: On November 20 at 0030 GMT the CAPE II satellite is scheduled to be launched.

CAPE stands for Cajun Advanced Picosat Experiment and is a completely nonprofit and student run organization which develops and builds picosatellites.

The frequencies are 145.825 MHz FM and 437.325 MHz FSK. On the VHF FM frequency the beacon will be in CW and AX.25

Please listen to our sat and send reports to me at quadpugh(a)bellsouth.net
Please include your location and time you first hear our sat.

The preliminary Keplerian Two Line Elements (TLEs) are:

ORS3-2.5B
1 99905U 00000   13323.95403993 0.00000000 00000-0 00000-0 0 0009
2 99905 40.5214 208.6139 0003075 205.2431 337.9664 15.19728651000004

Thanks
Nick Pugh K5QXJ

CAPE website http://ulcape.org/

Facebook https://www.facebook.com/CajunAdvancedPicosatelliteExperiment

[ANS thanks Nick Pugh K5QXJ & AMSAT-UK for the above announcement]

Dual-Band Slim Jim Antenna for Satellites

The AMSAT-SM website has an article on the dual-band omni-directional 145/435
MHz Slim Jim antenna developed by N9TAX.

Lars SM0TGU comments that the antenna works great for satellite passes below 30 degrees elevation, but signals are considerably weaker on high elevation passes.

Read the AMSAT-SM article in Google English at
http://tinyurl.com/AMSAT-SM-Dual-Band-Antenna

Further information on the N9TAX dual-band Slim-Jim antenna is at
http://n9tax.com/Slim Jim Info.html

The antenna is available via the Two Way Electronix website at
http://www.2wayelectronix.com/

[ANS thanks AMSAT-SM & AMSAT-UK for the above announcement]

PhoneSat 2.4

*** UPDATE ***
A Minotaur I rocket carrying the DOD's Operationally Responsive Space-3 mission successfully launched at 8:15 p.m. EST, November 19. The PhoneSat 2.4
payload also successfully deployed and sent its first transmissions. The satellite is performing as expected.

For the second time this year, NASA is preparing to send a smartphone-controlled small spacecraft into orbit. The PhoneSat 2.4 mission is demonstrating innovative new approaches for small spacecraft technologies of the future.

The NASA PhoneSat 2.4 is hitch-hiking a ride onboard an Orbital Minotaur I rocket slated for a November 19 liftoff from the Mid Atlantic Regional Spaceport at NASA's Wallops Flight Facility in Virginia. The primary payload on
the booster is the U.S. Air Force Office of Responsive Space ORS-3 mission, which will validate launch and range improvements for NASA and the military.

PhoneSat 2.4 builds upon the successful flights of a trio of NASA smartphone satellites that were orbited together last April. That pioneering mission gauged use of consumer-grade smartphone technology as the main control electronics of a capable, yet very low-cost, satellite, reports Andrew Petro,

program executive for small spacecraft technology at NASA Headquarters in Washington.

Each smartphone is housed in a standard cubesat structure, measuring roughly four inches square.

The soon-to-be lofted PhoneSat 2.4 has two-way radio communications capability, along with reaction wheels to provide attitude control, Petro says,
and will be placed into a much higher orbit than its PhoneSat predecessors. Those were short-lived, operating for about a week in orbit.

Tabletop technology

“We’re taking PhoneSat to another step in terms of capability, along with seeing if the satellite continues to function for an extended period of time,”
Petro explains.

The PhoneSat mission is a technology demonstration project developed through the agency’s Small Spacecraft Technology Program, part of NASA’s Space Technology Mission Directorate.

NASA PhoneSats take advantage of “off-the-shelf” consumer devices that already
have many of the systems needed for a spacecraft, but are ultra-small, such as
fast processors, multipurpose operating systems, sensors, GPS receivers, and high-resolution cameras.

“It’s tabletop technology,” Petro says. “The size of a PhoneSat makes a big difference. You don’t need a building, just a room. Everything you need to do
becomes easier and more portable. The scale of things just makes everything, in
many ways, easier. It really unleashes a lot of opportunity for innovation,” he
says.

There’s another interesting aspect to using the smartphone as a basic electronic package for PhoneSats.

“The technology of the consumer electronics market is going to continue to advance,” Petro notes. “NASA can pick up on those advances that are driven by
the needs of the consumer.”

What’s the big deal about small satellites?

NASA is eyeing use of small, low-cost, powerful satellites for atmospheric or
Earth science, communications, or other space-born applications.

For example, work is already underway on the Edison Demonstration of Smallsat
Networks (EDSN) mission, says Petro. The EDSN effort consists of a loose formation of eight identical cubesats in orbit, each able to cross-link communicate with each other to perform space weather monitoring duties.

Magic dust

The three PhoneSats that were orbited earlier this year signaled “the first baby step,” says Bruce Yost, the program manager for NASA’s Small Spacecraft Technology Program at the Ames Research Center in Moffett Field, Calif.

“The PhoneSat 2.4 will be at a higher altitude and stay in space for a couple
of years before reentering,” Yost adds. “So we’ll be able to start collecting
data on the radiation effects on the satellite and see if we run into anything
that causes problems.”

Yost says where the real “magic dust” of PhoneSats comes into play is how you
program them. “That is, what applications can you run on them to make them
useful. We’re adding more and more complexity into the PhoneSats.”

To that end, PhoneSats and the applications they are imbued with can lead to
new ways to interact with and explore space, Yost observes. “You can approach
problems in a more distributed fashion. So it’s an architectural shift, the
concept of inexpensive but lots of small probes.”

NASA’s Petro sees another value in pushing forward on small satellites.

“It used to be that kids growing up wanted to be an astronaut. I think we
might be seeing kids saying, what they want to do is build a spacecraft. The
idea here is that they really can do that,” Petro says. “They can get together
with a few other people to build and fly a spacecraft. Some students coming out
of college as new hires have already built and flown a satellite…that’s a whole
new notion, one that was not possible even 10 years ago,” he concludes

[ANS thanks NASA for the above announcement]

ARISS News

Update will occur in ANS-335

Satellite Shorts from all over

Update will occur in ANS-335

/EX

In addition to regular membership, AMSAT offers membership in the

President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
Joe Spier, K6WAO
k6wao at amsat dot org